

**Claims:**

1 1. Process for the manufacture of doped silica bodies comprising:

- 2 (a) preparing a porous body of silica particles, the porous body  
 3 having a first porous region that is up-doped and a second porous  
 4 shell region comprising a lower doped or undoped portion,  
 5 (b) heating the porous body to a temperature of at least 1100 °C  
 6 in the absence of fluorine for a period sufficient to selectively  
 7 consolidate the first porous region,  
 8 (c) heating the porous body in a fluorine atmosphere to dope the  
 9 silica particles in the second porous region, and  
 10 (d) heating the porous silica body at a temperature greater than  
 11 1300 °C to consolidate the porous silica body.

2 2. Process for the manufacture of optical fibers comprising:

- 3 (a) preparing an optical fiber preform,  
 4 (b) heating the preform to the softening temperature, and  
 5 (c) drawing an optical fiber from the preform

6 the invention characterized in that the optical fiber preform is produced by:

- 7 (i) preparing a porous body of silica particles, the porous body  
 8 having a first porous region that is up-doped and a second porous  
 shell region comprising a lower doped or undoped portion,

- (ii) heating the porous body to a temperature of at least 1150 °C in the absence of fluorine for a period sufficient to selectively consolidate the first porous region,
- (iii) heating the porous body in a fluorine atmosphere to dope the silica particles in the second porous shell region, and
- (iv) heating the porous silica body at a temperature greater than 1300 °C to consolidate the porous silica body.

3. Process for the manufacture of optical fibers comprising:

- (a) preparing an optical fiber preform,
- (b) heating the preform to the softening temperature, and
- (c) drawing an optical fiber from the preform

the invention characterized in that the optical fiber preform is produced by:

- (i) preparing a porous silica core rod of silica particles, the core rod having an inner up-doped region surrounded by an outer shell region, said outer shell region comprising a lower doped region,
- (ii) heating the porous silica core rod to a temperature of at least 1100 °C in the absence of fluorine for a period sufficient to selectively consolidate the inner up-doped region,
- (iii) cooling the porous silica core rod
- (iv) introducing a fluorine-containing atmosphere with a first fluorine concentration to deposit fluorine on the silica particles in the lower doped region,

- (v) reducing the fluorine concentration, and
- (vi) heating the porous silica body at a temperature greater than 1300 °C, to consolidate the porous silica core rod.

4. The process of claim 3 wherein the fluorine atmosphere comprises SiF<sub>4</sub>.

5. The process of claim 4 wherein the fluorine atmosphere is greater than 10% SiF<sub>4</sub>.

6. The process of claim 3 wherein the outer shell region is undoped silica.

7. The process of claim 3 wherein the inner core region is doped with germania.

8. The process of claim 7 wherein the inner core region is doped to a  $\Delta n$  in the range 0.001-0.058..

9. The process of claim 3 wherein the temperature used in step (iii) is in the range 500 - 1100 °C.